4:Grajdanzev--3-4 S-4 (no date) 1942 Formosans
116, 132, 175

"Its climate and vegetation are tropical, a fact which was of special importance to Japan, which is situated in the temperate zone and which, before the World War, had no possessions in the tropics, except Taiwan. After the War she received a mandate over the German Pacific islands lying north of the equator, but their total area is only 2,149 sq. km. (830 sq. miles). Thus before the recent occupation of Kwangtung and Hainan Island, Taiwan was the only important Japanese possession in the tropics. As we see later, [4] this had an important bearing on Japanese economic policy there."

4:Grajdanzev--5-6 S-4 (no date) 1942 Formosans
116, 132, 137

"Situated as it is in the tropics, Taiwan has high temperatures with small variations from year to year, and relatively small fluctuations from month to month.

Average Yearly Temperatures In Taiwan At Sea Level

	Centigrade			Fahrenheit		
	1931	1932	1936	1931	1932	1936
Taihoku (north)	21.6	21.6	21.7	70.9	71.9	71.2
Taichu (middle)	22.1	22.1	22.1	71.8	71.8	71.8
Koshun (south)	24.3	24.3	24.4	75.7	75.7	75.9

Source: Japan-Manchoukuo Year Book and Taiwan Jijo.

The average annual temperature in Manila is 26.6°C. and in Hongkong 22.2°C. January temperature in Koshun is a little above that of Miami, Florida, and the July temperature is the same. Taiwan at low levels thus resembles Florida and is considerably warmer than California. Tropical fruits can [6] ripen in Taiwan and it is possible to raise two crops of rice from the same field and in some cases to grow a third crop also, usually of some vegetable. Land may be used much more intensively than in Japan. Frost is very rare in Taiwan (2) while snow is unknown, even on the mountains.

2. The lowest temperature observed was -0.2 C (31.6 F) at Taihoku and -0.1 C (31.8 F) at Taichu."

"Not less important for the vegetation is rainfall, and in this respect Taiwan is numbered among the places with heavy precipitation, as may be seen from the following table:

Yearly Precipitation

Taiwan (1936)	In mm.	In inches
Taihoku	1,913	75.4
Keelung	3,175	135.0
Taichu	1,503	59.2
Taito	1,132	44.5
Koshun	1,708	67.3
Averages		
Singapore	2,340	92
Calcutta	1,930	76
London	636	25
Key West (Florida)	968	38.1
Mobile (Alabama)	1,565	61.6
New York City	1,094	43.0
San Francisco	559	22.0

It is apparent that in spite of the smallness of the island there are very sharp differences in rainfall between its various regions. The difference appears even more striking when we examine the seasonal distribution of precipitation:

116, 132

Precipitation In Taiwan In MM. (1936)

	Jan. -April	May-August	Sept. -Dec.	(Oct. -Dec.)	Total
Taihoku (N. W.)	789	881	184	(108)	1, 913
Keelung (N.)	1, 503	571	1, 102	(881)	3, 175
Taichu (W.)	426	852	226	(. 48)	1, 503
Karenko (E.)	292	568	246	(161)	1, 105
Tainan (S. W.)	159	1, 268	41	(10)	1, 468
Taito (S. E.)	232	706	192	(54)	1, 132
Koshun (S.)	227	1, 309	172	(47)	1, 708

[7] It may be seen from this table that there is a marked difference between seasons. In all districts except Keelung, the May-August period brings most of the rain, while the September-December period, and to a less marked degree the January-April period, are dry. This fact is of extreme importance for Taiwan's agriculture."

4:Grajdanzev--7 S-4 (no date) 1942 Formosans
116, 132, 311

"It means that Taiwan, and especially the agricultural region around Tainan where the plain is broadest, suffers periodically from a too heavy rainfall and from dry periods.(3)

> 3. Not only seasonal distribution of precipitation is important, but also its distribution by days and even hours, and this distribution is extremely unequal in Taiwan. In Koshun maximum daily precipitation was 240 mm. and in Taichu 310 mm. (12 inches), or in one day (probably in one or two hours) more than in the four months of September-December. This leads, of course, to flood conditions and extensive damage.

For cultivation to be successful in these conditions necessitates, on the one hand, special arrangements for the prevention of floods and for drainage and, on the other, for irrigation. Only with the help of irrigation can the rich soils of Taiwan give maximum returns. One cannot say that the Chinese neglected irrigation before the coming of Japanese administration. However, they were ignorant of efficient Western methods of controlling the rivers, and in many cases only these methods, applied by Japanese specialists, could give good results."

"As to the winds, in winter northeast monsoons blow from the continent and in summer southern monsoons from the sea bring rains and storms. Violent storms—typhoons—are frequent and extremely destructive. At Koshun storms were observed with a velocity of 86 miles per hour. Typhoons come either from the direction of the Philippine Islands, passing [8] through the eastern part to the northeast in the direction of Japan, or from the south, to the north through the island, and then towards China."

6: Kirchhoff--27 [3] U-4 (no date) 1895 Formosans
116, 132

Formosa is in the torrid zone, for even the north (Ki-lung) has an average temperature of 21.4° C., and an average variation of temperature of 14° (January 14.2°, July 28.2°). Lying in the Southeast Asiatic monsoon belt, the island occupies a very curious place with regard to the distribution of rainfall throughout the year. For the southwest monsoon of the summer alternates with the northeast monsoon of the winter, and the northeast monsoon, sweeping over the sea warmed by the Kuro-schio (which makes possible the continued existence of reef-building coral in the bays of Su-aô and Ki-lung) also brings rain, and indeed the principal rain, at least for the northeast coast, so that Ki-lung, for example, and perhaps also a large part of the island—the northern part, we may assume—has two rainy periods. One of these is in the winter and lasts until the spring, the other in late summer, lasting until late in the fall. This remarkable fact does not emerge when, like Wojeikof, only January is compared with July, the month with the lowest rainfall.

6: Kirchhoff--27 [4] U-4 (no date) 1895 Formosans
116, 132

Ki-ling has an annual rainfall of 3,050 mm., the heaviest rainfall occurring between January and May, and the next heaviest between August and October:

January	572 mm	April	292 mm	July	95 mm	October	206mm
February	301 "	May	302 "	August	219 "	November	130 "
March	272 "	June	113 "	September	384 "	December	164 "

But it would be a mistake if the greater rainy season were to be attributed to the northeast monsoon alone and the smaller to the southwest monsoon alone. The southwest monsoon predominates as early as May, and is much stronger in June and July; nevertheless these two summer months have only 7 rainy days each. August, with almost double the rainfall of July (with 95 mm.) on 16 days, is still under the sway of the southwest monsoon, while September, as all over the island, is the month during which the monsoons change.

The period from November to the beginning of May is given by Imbault-Huart as the rainy period for the town of Tam-sui. There as in Ki-lung the summer is oppressively hot; during the day the temperature is usually 30°; in the winter it sinks [28] rarely below 10°, and even in the neighboring mountains little snow falls.

On p. 7 of his report Hosie gives the following table, for four years at Tam-sui, of the rainfall and the extremes of temperature:

	1887	1888	1889	1890	1891	Average	Extremes in temp. 1887-91	
	Rain in mm.							
January	169	80	194	273	14	146	25.0°	5.0°
February	139	357	133	50	169	169	26.1	4.4
March	200	73	199	368	321	232	28.3	6.1
April	153	147	295	64	82	148	31.1	8.9
May	119	103	179	180	350	186	33.3	15.0
June	10	444	208	107	284	210	35.0	16.7
July	326	13	32	188	135	139	37.8	21.1
August	45	165	248	96	189	149	37.8	19.4
September	207	217	21	125	439	202	35.0	18.9
October	228	71	112	307	33	150	35.0	12.2

6: Kirchhoff--27-28 U-4 (no date) 1895 Formosans-2
116, 132

	1887	1888	1889	1890	1891	Average	Extremes in temp. 1887-91	
		Rain in mm						
November	56	70	237	52	118	107	30.6°	12.2°
December	44	172	64	104	60	89	27.2	5.6
Year	1696	1912	1922	1914	2194	1927	37.8	4.4

If we now compare the Ki-lung rainfall curve with that of Tam-sui, it appears that the latter town has a much more equable distribution of rainfall throughout the year, and the displacement of the chief maximum from January to March; December, in Tam-sui, appears as the driest month, the chief rainy season falling in spring rather than in winter. But here too the curve of rainfall sinks during the summer months as in Ki-lung, reaching the lowest summer level in July, just as it does there (though not quite so low a level as in December), and also reaching in September the highest level of the new rise that sets in in late summer.

While Tam-sui receives the heavy rains in the cool months, the closest mountains being hidden behind thick clouds, even the sun hardly appearing, in the southwest the situation is exactly reversed. Tai-nan has an agreeable, healthy climate in winter, especially in December and January, except that the northeast monsoon spreads a great deal of dust and sand from the great plain over the town (an indication of the dryness of the winter in this part of the island). But the summer brings tropical heat and tropical falls of rain, the latter in July and August especially;* for days on end the thermometer

*Heavy fall rains are also mentioned as occurring in the region of Kia-y, the mountain streams swelling so greatly that they often in places burrow out a new bed for themselves over stretches of the soft soil of the level ground at the foot of the mountains. (Imbault-Huart).

does not sink below 32 1/2°, the heat by day rises to 38°, and the sultry nights are hardly bearable.

"Temperatures permit the growing of many kinds of crops in all seasons, but it is mainly the uneven distribution and amount of the rains that set the agricultural season. In the southern part of the island rainfall is concentrated in the summer; the winter is extremely dry. In places without irrigation, only one crop of paddy rice can grow, and the time for seeding and planting is fixed. In the northern part, though there is no dry season, the low temperatures and frequent rain in winter are not suitable for paddy rice, and there is a longer time for intermediate crops and fallow. The typhoon season and the length of day are also factors controlling the farming rhythm."

8: Chen--446
116, 132, 133

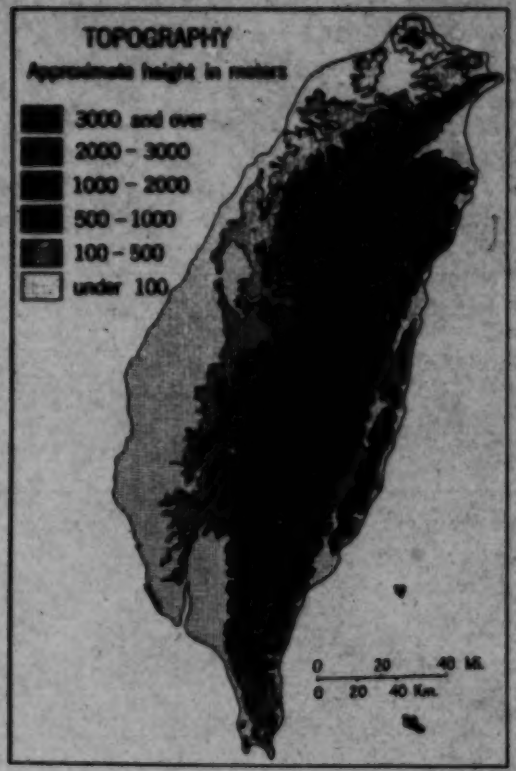

Fig. 2

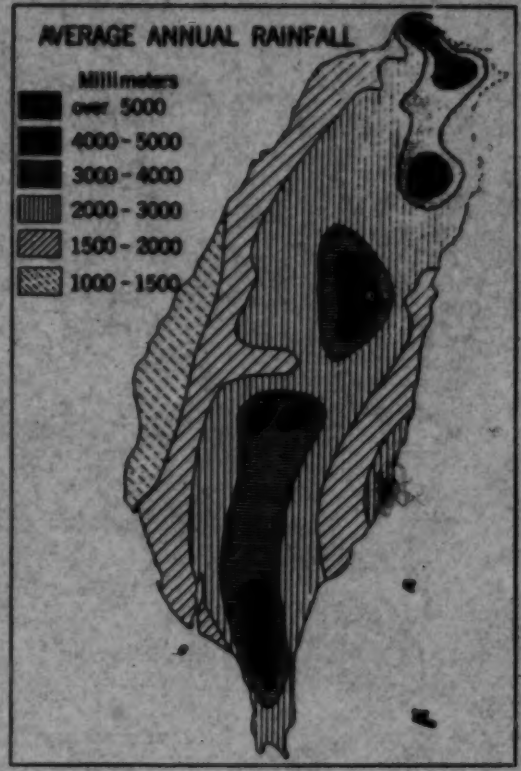

Fig. 3

8: Chen--454[2] N-3 (no date) 1951 Formosans
116, 132, 241, 312

"IRRIGATION

The general increase in per hectare production in Formosa in recent years is largely due to the progress of irrigation and additional fertilization, as well as to improvement of cultivation and seeding. Because of the great variation in rainfall and the location of the main agricultural region on the western coastal plan, where the winter is extremely dry and the dry season is long, irrigation is necessary. On the other hand, in summer, especially when typhoons pass over the island, the precipitous topography results in floods. The northeast corner, facing the northeast winter monsoon, has plenty of rain the year round; in fact, in many places the winter rainfall is greater than that of summer, and floods are not infrequent. Consequently, drainage and flood control are as important as irrigation."

9: Yamasaki--229 [3] N-5 (1896-1897) 1900 Formosans
116, 132, 654

Like the scientific investigation of Taiwan in general, the systematic examination of the climate also does not begin until the establishment of Japanese rule. In 1897 five meteorological stations were set up, in Taihoku, Taichū, Tainan, Kōshun and Hōko-tō. The organization of simultaneous and corresponding observations in these and other Japanese stations, as also in China and Korea, undoubtedly effected a new advance in East Asiatic climatology. Very carefully observed is the cyclone, which frequently every summer or fall begins in the neighborhood of Taiwan and gradually proceeds north to Japan, and in the regions it touches, precautionary measures are adopted, depending on the weather prospects.

9: Yamasaki--229 [4] N-5 (1896-1897) 1900 Formosans
116, 132

In the southern part of Taiwan there is naturally found, in view of its latitude, a tropical and sub-tropical climate. Apart from the geographic position, the climate of the island is determined chiefly by the influences of the warm Kurosiwo and the high mountain range, which runs along the whole island from north to south. In summer the temperature rises to 37° in Tainan, while in winter there is frost in the mountainous region and sometimes snow in North Taiwan. Heavy precipitations in North Taiwan and strong wind in Hōko-tō are peculiarities worthy of note. The material found in the following descriptions is taken chiefly from our recent observations.

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans-1-3
116, 132

Temperature. The following summary gives the average figures found in the five observation posts in 1897 and 1898.

	Average Temperature (Centigrade)				
	Taihoku	Taichu	Tainan	Kōshun	Hōkotō
January	16.2	16.5	18.2	21.3	16.3
February	14.7	15.6	17.7	21.1	15.8
March	17.9	18.9	20.5	23.5	18.2
April	19.3	21.1	23.0	24.9	21.3
May	25.1	26.9	27.6	27.5	25.9
June	26.4	26.8	27.5	27.0	27.1
July	27.8	27.1	27.8	27.3	27.7
August	27.3	26.7	27.4	26.9	27.2
September	26.5	26.7	27.9	27.0	27.4
October	23.4	24.3	25.4	25.8	24.7
November	20.5	20.9	21.8	23.5	21.6
December	16.0	16.5	17.9	21.0	17.5
Average	21.7	22.3	23.6	24.7	22.6

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans-2
116, 132

Average Maximum Temperature.

January	20.0	21.3	25.2	24.6	19.6
February	17.6	19.9	24.8	24.5	18.4
March	21.7	23.6	27.0	27.1	20.8
April	22.9	25.5	28.9	28.4	23.8
May	29.6	30.7	32.4	31.4	28.6
June	30.6	30.7	31.5	29.5	29.7
July	32.7	31.4	32.3	30.3	30.1
August	31.5	30.7	31.1	29.5	29.6
September	31.0	31.3	32.9	30.6	30.7
October	26.8	29.0	30.7	28.4	27.3
November	23.3	25.8	27.1	25.8	23.7
December	19.5	22.2	24.6	23.5	19.7
Average	25.6	26.8	29.0	27.8	25.2

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans, 3
116, 132

[230] Average Minimum Temperature.

January	13.6	13.1	13.9	18.3	14.9
February	12.2	12.7	13.5	18.2	13.8
March	15.3	15.9	16.2	20.7	16.0
April	16.6	17.8	18.8	22.0	19.0
May	21.6	22.7	23.6	24.2	23.6
June	23.2	23.8	24.6	24.7	25.0
July	24.1	23.5	24.3	24.5	25.4
August	24.3	23.7	24.4	24.7	24.9
September	23.3	23.4	24.2	24.2	25.5
October	21.0	21.1	21.9	23.6	23.1
November	18.7	17.6	18.4	21.4	20.1
December	13.4	12.4	13.6	18.6	16.0
Average	18.9	19.0	19.8	22.1	20.6

The coldest month is February; only Kōshun can show an average temperature of 21.0° in December as compared with 21.1° in February. The average minimum is always found in February in all stations, and the absolute minimum temperature is 3.3° in Taihoku, 3.2° in Taichū, 3.5° in Tainan, 11.8° in Kōshun and 9.9° in Hōko-tō. The warmest month is July all over the island; but the maximum temperature is not limited to this month. In Taihoku and Taichū the average maximum temperature falls in July and at other stations in September. The maximum temperature varies between May and September. It rises to 34.6° in Taichū in May, 36.9° and 36.5° in Taihoku and Tainan, 33.4° in Kōshun in July, 33.5° in Hōkotō in September. The variation of temperature is greater in the north than in the south. In Taihoku the difference between maximum and minimum amounts to 33.2°, while in Kōshun it amounts only to 21.6°, where the lowest temperature in winter does not fall below 10°. The amplitude is also greater in winter than in summer. Taihoku can show the minimum temperature of only 3.5° in February, while the maximum in the same month is 31.3°.

9: Yamasaki--230 [2] N-5 (1896-1897) 1900 Formosans 116, 132

Barometric pressure and winds. The barometer reading is high in December and January and low in June, July and August. In winter, the pressure is higher in the north than in the south, while in the summer it is higher in the east than in the west. Observations reduced to sea level and 0° c., gave the following results.

	Average Barometric Pressure in:				
	Taihoku	Taichu	Tainan	Kōshun	Hōkotō
January	766.3	763.4	765.6	763.1	764.0
February	63.6	61.7	61.6	61.3	62.2
March	62.2	60.9	60.8	60.6	61.2
April	61.5	60.0	59.7	59.8	60.3
May	57.3	56.9	56.9	57.3	57.1
June	53.6	53.5	53.5	54.2	53.6
July	56.0	55.9	55.9	56.5	55.9
August	53.4	53.5	53.8	54.6	53.6
September	57.4	56.5	56.4	57.0	56.7
October	60.1	58.0	58.8	58.2	58.5
November	62.3	59.7	59.7	59.5	60.3
December	66.0	63.4	63.4	62.9	64.0
Average	759.9	758.6	758.6	758.8	758.9

9: Yamasaki--230 [3] N-5 (1896-1897) 1900 Formosans 116, 132

Since the island lies in the monsoon region, the wind is very regular. From September to April north and east winds predominate. The direction of the wind varies in every station as a result of the topographical conditions. Thus we have east wind in Taihoku, north wind in Taichū and Tainan and northeast wind in Hōkotō and Kōshun. Between May and September the direction of the wind is rather irregular in every station, but the south wind predominates. In Hōko-tō, an isolated level island in the open sea, the direction of the wind is very regular and always changes from NNE to SW during a year. The average velocity of the wind varies between 2.9 m. per second in Taichū and 11.1 m. in Hōko-tō. The northeast monsoon is much stronger than the southwest monsoon, and in Hōko-tō we have always a strong wind, 10 m. per second during the period of the northeast monsoon. The strongest wind so far observed is that of September 30, 1898, in Hōko-tō, which had a velocity of 56.4 m. per second. The frightful cyclone or typhoon which springs up two or three times every year in the China Sea often begins to the east of Taiwan or the Philippines region and travels north along the east coast of Taiwan, with its centers about 2 degrees distant from the coast.

9: Yamasaki--230 [4] N-5 (1896-1897) 1900 Formosans
116, 132

Humidity and Precipitation. The latitude of Taiwan in itself is sufficient to raise expectations of great humidity. The monthly average is over 80%, and varies between 93% and 73%. On the driest days the humidity is only 31%. In winter it is greater in the north and less in the south, while in summer the opposite holds.

9: Yamasaki--230-231 N-5 (1896-1897) 1900 Formosans
116, 132

The time and the amount of precipitation on Taiwan are very remarkable. The north east monsoons of the winter, which blow over the warm current, the Kurosiwo, bringin with them much moisture, strike against the high mountains of northern Taiwan and fal down again on their northeast side. Consequently we have a rainy season in northern Taiwan during this monsoon. It is said that the precipitation in this region is the heavi in the northeast monsoon region, and especially in Kilung, a port at the foot of the moun tains on the island's north coast, it attained a height of 5238.4 mm. in 1898. An intere ing view is obtained when one sees from a distance, on the western side of the Central chain, the thick layers of cloud which rise from the east to the mountain crest but then move on only a little farther, since the warmer...air on the western side dissipates them again. The phenomenon resembles that of the "tablecloth " of the Table Mountain, in South Africa. In Taihoku, [231] which is on the other side of the range and is only 40 km. distant from Kilung, the precipitation is less than half as heavy as in the latter locality.

When the southwest monsoon has begun, the southwestern part of the island has heavier precipitation than the northeast. Tropical storms often occur, and the rainfall during them often attains considerable proportions. Thus Kōshun, during June, 1897, had 1,535.7 mm. But this was probably a rare exception. The whole western side of the island, as the following summary shows, received by far the heaviest precipitation during the summer, the maximum being in August.

9: Yamasaki--231 N-5 (1896-1897) 1900 Formosans
116, 132

	Average Rainfall				
January	71.7	35.8	9.5	10.9	11.3
February	207.0	159.9	132.8	83.0	78.6
March	71.1	43.2	36.6	48.0	21.4
April	156.3	82.9	43.9	16.5	54.5
May	184.2	96.8	53.6	46.9	46.8
June	229.0	475.0	535.5	1345.7	155.3
July	178.5	296.8	206.6	239.9	203.9
August	690.0	866.5	676.9	482.1	549.5
September	273.3	96.5	54.4	129.6	17.0
October	179.0	18.7	56.6	241.6	55.1
November	114.9	20.8	34.6	154.0	43.5
December	80.3	8.6	3.8	13.8	3.0
Whole year	2435.6	2201.7	1835.0	2911.8	1240.2

9: Yamasaki--231 [2] N-5 (1896-1897) 1900 Formosans
116, 132

According to the observations conducted over a period of five years by A. Hosie, the English consul in Tamsui, the average rainfall in this port amounted to 1,927 mm.*

* Alex. Hosie, Report on the Island of Formosa, presented to both Houses of Parliament, 1893, p.6.

10: Schumacher--223-224 T-1 (ca. 1896) 1898 Formosans
116, 132

The climate of Formosa has not always been so dangerous as it is nowadays but conditions have become much worse. If a change has been brought about it should also be possible to find means to render it more bearable again. The sudden drop in temperature during the early hours of the morning is, however, [224] most dangerous and this problem can be solved only by a suitable method of house construction and manner of living.

20: Alvarez--248 [4] (no date) 1927 Formosans
116, 132

"Its climate, changeable and rather hot, is however, healthy owing to the South-Western Monsoon that blows continually from May to September, and the North-Eastern Monsoon, from November to April. To this extremely favourable circumstance may be added the benign influence of the sea-current called Kuroshimo, which rushes along the shores of the island. The climate is moist owing to the exuberant vegetation of the vast virgin forests and the pathless wildernesses. The island is not unhealthy; nevertheless, there occur very frequently cases of malarial fever, to which one is exposed especially during the summer."

31: Hofmann--604-605 N-3 (1909) 1912 Formosans
116, 132, 164

The climate is mild and saturated with humidity; it has a soothing, lulling effect. The greatest number of rainfalls occurs in the north of Formosa (3,440 millimeters per year in Kilung), where they occur regularly throughout the year. In the south of the island there is a dry season during the winter months and a rainy season which begins about the end of May. It is, unfortunately, not possible to stamp out malaria altogether. This disease often occurs here in its most severe [605] form and is fatal after a short time. The agricultural districts, however, are dependent on the humidity which causes the miasma; for any visitor to the island, therefore, quinine is an absolute necessity.

31: Hofmann--612 N-3 (1909) 1912 Formosans
116, 132, 361

My stay in the region of the Tsou aborigines was longer and more rewarding than my visit to Taikokan. We started from the small village of Kagi approximately in the center of the island. We arrived there after a journey during hot weather, having traveled by train, on May 12th, 1909. We immediately become aware of the change in climate. While in the north there had been a great deal of rain and humidity, here there was drought; the humid northern winds which predominate in the spring do not penetrate to the center of Formosa. In Kilung and Tahoku the abundant rainfalls are evenly distributed throughout the entire year while in this region the rainy season begins at the end of May and lasts until October. The effect of these climatic differences may be seen in the vegetation; here there are far more xerophytic plants. In the north at this time of the year the rice fields are already green, while here the soil has not yet been plowed since the plants could not grow. There was not a cloud in the sky and we were exposed to the full heat of the sun. Kagi, a village which otherwise does not offer anything of interest, was shrouded in a cloud of yellow dust. In 1907 a violent earthquake occurred here; of the buildings of former times little has remained except the gates of the city. On Formosa all the cities in the Chinese region are enclosed by walls and ramparts (cf. Fig. 1); a European who visits these cities is reminded of the medieval cities of Europe.

31: Hofmann--615 [2] N-3 (1909) 1912 Formosans
116, 132

We spent the night in a small hut near the railway which was being built in Karapen, at an altitude of 1,080 meters, beyond the first mountain ridge. We arrived here in the afternoon; shortly afterwards it began to rain. The valley and the hill which we had passed during the day had been completely dry. From here on, however, as long as we remained above an altitude of 1,000 meters, there were copious rainfalls every day durin the hot part of the day; the rain never lasted very long, and the morning and evening were always clear.

31: Hofmann--627-628 N-3 (1909) 1912 Formosans
116, 132, 311, 249

The sugar industry on Formosa has increased considerably; this industry will become [628] still more profitable when the projected plan for a system of irrigation with artificial dams has become a reality. In this way the tributary of the southern Tamsui may be utilized and more soil than hitherto will be irrigated. Southern Formosa is affected by the drought every winter.

The bay and lagoon of Takao offer a beautiful sight. The lagoon is connected with the ocean by a narrow opening, hemmed in by coral reefs; large boats therefore cannot enter the bay. Work on harbor installations is still in progress; this is an ambitious and costly project, but it is a necessary step in establishing communication with the south. It will also be necessary to make the harbor safe, especially since the roadstead of Takao offers no protection even to large steamers during the frequent and violent typhoons. The most dangerous months for typhoons are June, July, and August. The direction of the wind, which may develop a velocity of 100 miles per hour, is from east to west. For those harbor installations which are made of wood, the Teredo navalis is extremely destructive. Pine wood may be destroyed by these worms within three months, while Chamaecyparis wood may last for one year. Timber which is used for buildings on land (for railways, telegraph poles, etc.) is destroyed by white termites, but if the wood is impregnated with tar, this forms a sufficint, though costly, protection. The bay within the lagoon is about 22 kilometers long and 5 kilometers wide at its widest point. Around the bay there are artificial sea gardens. Among the plants growing wild there are first of all pandanus groves, which probably form one of the most unusual features in the vegetation of Formosa; while in other regions of the island pandanus grows only in the form of shrubs here it is tree-like and forms a plant typical of coastal regions.

Another unusual form of vegetation of a purely xerophilous character is a species of

tropical Euphorbia Tirucalli (spurge); here it has hardly any leaves, since their place is taken by green branches. Its habitat is among the rocks on the beach, and it may grow as high as ten meters. [629] Finally, there are several species of mangrove along the level coast of the lagoon of Takao.

37: Steere--316 [2] S-3 (1873-74?) 1875 Formosans
116, 132, 311, 241

"The southern part of the island is in the tropics. There is much rain in the north part of the island, especially at Kelung. At Takao and Taiwanfu, it is dry from October to April, but it rains much sooner in the mountains to the east, the rains already beginning there in February. Rice is the principal crop cultivated upon the low level lands to the west, and there is much exported to China. The best lands produce three crops annually. Lands that are harder to irrigate are planted to sugar cane, and large quantities of sugar are exported in foreign vessels to Japan and Australia. Upon the first of March ten or twelve vessels were lying at the ports of Takao and Taiwanfu, all loading with sugar."

137 the relatively small bamboo forest along the western foothills and steppe, and shrubs over the low slopes of the mountains.

VI. CLIMATE

132 Latitude, ocean currents, topographic features, and of most importance, the monsoons determine the climate of Formosa.

Generally speaking, the main island is semi-tropical. It separates, at its southern end, the Kuro-shio (ocean current) which flows northward, and lies within the great Asian monsoon system which provides strong northeast winds in winter and less pronounced southwest winds in summer. The result is that the island is windy and has generally high temperature and precipitation. However, dry winters are experienced in the southern plains.

The warm and humid summer lasts from May until September, the mild winter from December until February. The highest temperature rarely exceeds 100°F in the hottest summer months, July and August; the lowest has never been below 35° F in the coldest month of January.

Average annual rainfall ranges from 50 inches on the low eastern coast to 250 inches

• 132 and more on exposed mountain slopes. Although the northeast has no distinct dry season, the southwestern parts of the island have a marked winter dry season.

Typhoons occur between June and October as a result of the tropical cyclonic storms which sweep out of the western Pacific. The tremendous winds are usually accompanied by torrential rains which may destroy buildings, cause floods, and damage agricultural crops and forests. During the fifty-year period 1897-1946, there occurred 71 typhoons, of which twenty-seven were highly destructive.

Distinct climatic characteristics are found in the seven regions divided by Cheng-hsiang Chen.[2] The regions are shown on the map in the following page and are described briefly below:

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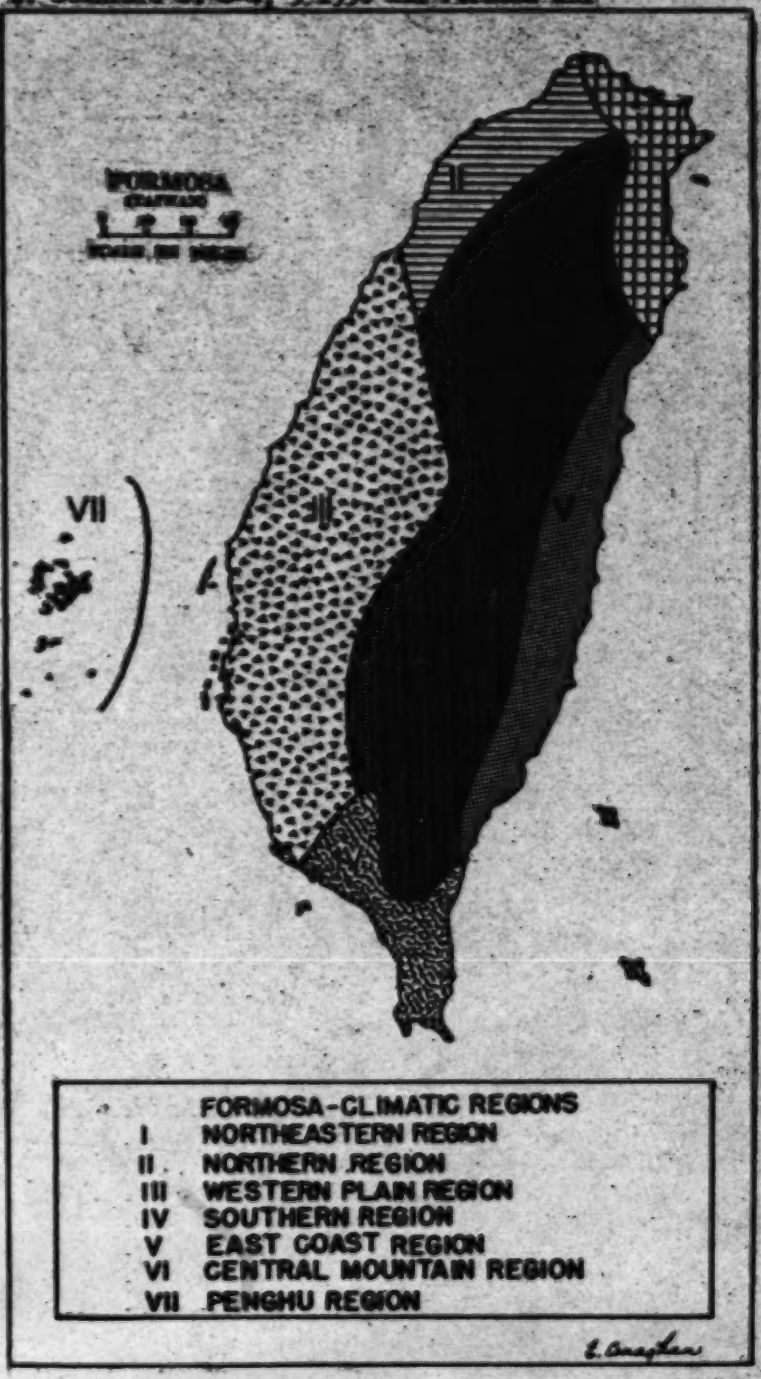
2. Cheng-hsiang Chen, op. cit., pp. 31-35.

Redraw Fig 4 to 05

1: Stanford U. S-4, 5.1956 XIII Formosa ATI



[Facing p. 11]

Northeastern Region

• 132 This region covers the northern corner of the main island. The northeast winds blow from the sea during most of the year. Annual precipitation in Keelung is 114 inches, and there is an average of 213 cloudy days a year. On the mountain slopes, precipitation varies from 150 to 200 inches a year. The summer rains are heavy and short in duration; the winter rains are, more or less, a continual drizzle. The average temperatures for the hottest and the coldest months are 82.4° F and 59° F respectively.

Northern Region

This region encompasses the southwestern section of Taipei hsien and the entire Hsinchu hsien. The coolest winters of the island occur here on the lowlands. However, average temperature of the coldest month, February, is just below 59° F. Frosts are seen very rarely and snow is non-existent except in the mountains at high altitude. Hsinchu and the adjacent coast are subject to strong winter winds.

Western Plain Region

The region is composed of the Tainan Plain and the foothills to the east. Winters are

•132 warm and dry, with the average temperature varying from 60 to 80 degrees. The rainy period, created by the southwest monsoon, is concentrated in the summer months of May through August, bringing a monthly average rainfall of 8 inches.

Southern Region

Pingtung Plain and Hengtsun Peninsula constitute this region. It has a tropical climate. Annual average temperature is 75° F, and the highest temperature at Hengtsun in the summer reaches 90° F. Winters are usually dry, but sometimes there are destructive gales. Annual precipitation ranges from 60 to 80 inches, of which 90 per cent falls in summer.

East Coast Region

This region, comprised of the Taitung Range and the adjoining trench, has an annual rainfall of 60 to 80 inches, two-thirds of which falls in summer. Temperature of the coldest month, January, averages 60°F.

Central Mountain Region

The central mountain ranges are included in this region. The high altitude, 3,000 feet above sea level, and exposure to prevailing

•132 winds bring an annual precipitation of more than 120 inches. Frosts are frequent and the higher mountains are snow-covered during the winter.

Penghu Region

This region comprises the Pescadores Islands, and is subject to strong wind almost all year round. The average velocity of 15 miles per hour is recorded, but during December the velocity is as much as 20 miles per hour. The precipitation amounts to about 40 inches a year.

VII. POLITICAL DIVISIONS

631 On August 16, 1950, the administrative areas of Formosa were rearranged into five municipalities, 16 hsien, and Yangminshan Administration. The five municipalities are: Taipei, Tainan, Keelung, Kaohsiung, and Taichung. The sixteen hsien are: Taipei, Taoyuan, Miaoli, Changhua, Yunlin, Tainan, Pingtung, Hualien, Yilan, Hsinchu, Taichung, Nantou, Chiayi, Kaohsiung, Taitung, and Penghu (Pescadores).

52:Barclay S-5 (no date)1954 AD1 Formosa AD1

CHAPTER I

The Growth of Population

101 In the last century and again in modern times, Taiwan has repeatedly become the object of rivalries among some of the most powerful nations of the world. Though its history has been a succession of disruptive incidents resulting from such contacts, by its size alone the island scarcely seems to merit the covetous attention that outsiders have given to it. It is not large—only 250 miles from north to [131] south, and about 90 miles across at the widest point. The area that it covers is only 14,000 square miles, or slightly less than that of the Netherlands. There is little in the way of precious minerals that would arouse the desire of industrial countries. It offers no great area into which other peoples can expand. It has only its significant location in the path of transportation routes off the coast of China, and a territory potentially rich in agricultural output. While the former of these has had the greater attraction to foreign nations, it is the latter that actually yielded—perhaps exceeded—the full measure of wealth that was expected.

•132 The topography and climate of Taiwan in the past have combined to make the island inhospitable to settlement. Being at the fringe of the tropics, the climate is hot and rainy, with marked changes of season and variations from one section to another. The greater part of its surface is not readily put to human use. Over half of this area consists of rugged mountains, rising steeply from a plain along the western coast and extending to the Pacific Ocean in the east. Heavy rainfall therefore runs off very quickly, creating torrential floods and occasional droughts in between. Large parts of the island are frequently swept by typhoons and shaken by earthquakes.

175 Within the span of recorded history, the difficulties presented by the physical environment never succeeded in discouraging human habitation. There were vague reports of residents there before A.D. 1000. When Taiwan first came officially to the attention of China, during the Ming dynasty, some tribes of primitives were known to be living near the western coast. Since the 16th century people swarmed to Taiwan from the relatively crowded parts of South China, and prospered there as agriculturists. The Japanese, who ruled the island from 1895 to 1945 and exploited its possibilities

1:Gallin E-4,5 (1957-1958) 1966
AD5 Taiwan Hokkien AD5
Formosa AD1

like the railroad lines, were all built during the Japanese occupation.

The mountain ranges serve as a kind of climatic divide. The area north of the mountains, which includes the Taipei region, is known for its long rainy season and cold raw winters. In the area south of the divide, and especially around Taichung and the interior mountain region, the weather tends to be milder, with far less rain and many days of bright sunshine.

On the trip south from Taipei to Chang-hua City the train crosses several large rivers which originate in the interior mountains and flow west to the Strait of Formosa. The rushing torrents of water during and immediately after the rainy season dwindle to a trickle during the dry season, meandering through wide, sandy, and rocky river beds.

At Chang-hua City the traveler must leave the train for a bus headed southwest to the old port city of Lukang. Although the buses leave every fifteen minutes during the day, they are invariably crowded with people and their bundles of produce, fish, a chicken or two, or even building materials.

The thirty-minute trip in an old wooden Japanese bus is made entirely on dirt roads. The ride may be dusty or wet according to the season, but it is always bumpy and noisy. In the dry season strangling dust pours into the bus from all sides. During the wet season, there is always a possibility that the passengers will have to leave the bus and wade while the bus creeps slowly along over the flooded roadbed. Many menthol-distilling factories, brickworks, and small rice mills line the way. The bus must cross many small irrigation canals and maneuver around oxcarts. As the bus moves further away from Chang-hua City and approaches the seacoast area of Lukang, a change in the agricultural landscape, resulting from differences in irrigation systems, becomes more and more noticeable. In those places where there is still no irrigation system, there are large areas of dry fields.

After a half-hour wait in Lukang, the traveler boards another, similar bus for the trip to the village, which lies about three miles inland or southeast of Lukang. The uncomfortable fifteen-minute ride ends when the bus comes to a halt in front of the Hsin Hsing village store.

The houses in the village are constructed of bamboo, mud or fired brick, and plaster. The foundations and structural uprights are usually brick; the walls are a latticework of bamboo strips, filled in with plaster which is a mixture of mud and cow dung. The plaster filling is usually whitewashed. Sometimes the main supports are not brick but heavy bamboo poles. Newer houses, and the older houses of the wealthy, generally have roofs of cement tile, while the oldest and poorest houses have thatched roofs. Houses made of mud bricks are always thatched.

1:Gallin E-4,5 (1957-1958) 1966
AD5 Taiwan Hokkien AD5
Formosa AD1 •

F 361

Taiwanese villages are laid out in three basic patterns. Probably the most common is the nucleated or compact type: the dwellings form a compact cluster which is surrounded by the arable land of the village. The second is linear, laid out along a riverbank or road, and the third, the least common, is the scattered settlement whose houses are spaced out over a larger area, which sometimes makes it difficult to determine the exact boundary of the village. Hsin Hsing, like most of the villages in the area, is a compact cluster of dwellings surrounded by farmlands. One can walk completely around the central cluster in about fifteen minutes.

T 361

T [491] [312]

The dwelling cluster is bounded on the southwest by the *hsien* dirt road which connects Lukang with the market town of Chi Hu (all of the villages in this immediate area lie on one or the other or both sides of this road) and on the northeast by an irrigation drainage stream which flows into the sea near Lukang. There are two villages quite close to Hsin Hsing. Lo Ts'e (now incorporated into Yung P'ing village) is along the road about three hundred yards to the northwest, and Ta Yu lies along the same road about eight hundred yards to the southwest. Like all the neighboring settlements, both are separated from Hsin Hsing by fields.

T 311

There are a few fields lying within the dwelling area itself. These are small, mainly garden plots, and are mostly on the outskirts rather than within the village. Hsin Hsing villagers own the fields across the road from the village as well as those between Hsin Hsing and the neighboring villages of Ta Yu and Lo Ts'e, but most of the fields operated by the villagers—either as owners or tenants—are usually not so conveniently located. Many lie to the west on the other side of the road and as much as two or three miles away. Some can be reached only by dirt roads and by narrow paths between the fields. The villagers ride their bicycles as far as they can and walk the rest of the way, often carrying heavy farm implements. A boy might go along leading or riding a water buffalo.

T [491] [487] [493] [231]

T 243 312

Village agriculture is focused primarily on wet-rice cultivation. Hsin Hsing village is located in one of the principal agricultural areas of the island, the long flat west-central coastal plain. With the Strait of Formosa to the west and the interior mountains to the east of the area, there is a natural flow of water from the mountains to the lower lands and finally to the sea. The usually plentiful water supply is harnessed by an intricate network of irrigation systems which consist of rivers, dams, pumping stations—both publicly and privately operated—and artificial waterways and ditches which eventually carry water into the maze of fields.

F 132

The area is subject to great seasonal variation in both temperature and precipitation. Although it lies in the semitropical zone—being

1:Gallin E-4,5 (1957-1958) 1966
AD5 Taiwan Hokkien AD5
Formosa AD1•

just north of the Tropic of Cancer—the winters of this coastal area, unlike the interior, are cold and raw while the summers are extremely hot and humid. Winter temperatures seldom fall below the middle forties, but icy winds frequently blow with almost gale force across from the mainland and the Strait of Formosa. Although the area itself never has snow, on a clear January or February day snow-capped peaks of the high interior mountains to the east can be seen from the village.

As in most of Asia, rain is seasonal. Between 80 and 85 percent of the annual rainfall comes during the late spring and summer months (April to September) (Chen, 1950:5).[1] During the heaviest rains and the late summer typhoon season, roads as well as paddy fields are often flooded. In this particular area, frequently the rain alone makes it possible to transplant the rice seedlings, for the irrigation water is often late in reaching the Hsin Hsing area, lying as it does so far from the mountain headwaters. With the passing of the rainy season the weather is relatively dry for the remainder of the year, and all crops depend almost entirely on water from the elaborate irrigation system.

For two decades or more this area has been able to harvest three crops annually. In the irrigated areas two crops of rice are grown; sometimes a vegetable or some other crop is substituted. The third dry crop is usually wheat or sweet potatoes. On dry land, two or possibly three crops a year are grown as well. Such intensive cultivation has been made possible through a favorable climate, irrigation facilities, and an increased availability of chemical fertilizer. It has also come about partially as a result of the population increase, which has provided additional labor to work the available land and to exploit previously undeveloped lands.

Although most of the original inhabitants from the mainland settled on the relatively fertile coastal plain where Hsin Hsing is located, the land resources could not be fully exploited because of their small number. Today, this situation is reversed, and in spite of large-scale irrigation, land scarcity makes it necessary for parts of expanding families, and even whole households, to move to urban centers to find work. Land scarcity in the whole Hsin Hsing area is so severe that even villagers who remain there must go outside the village to earn a livelihood for their families or to supplement the family income. Although the problem may be unusually acute in Hsin Hsing village and in some neighboring villages, it must nevertheless be recognized that it is characteristic of a large part of Taiwan. If the population of the rural areas of the island continues to grow at its present rate, the land scarcity which is now so severe in the Hsin Hsing area will undoubtedly become a major problem for the greater part of the Taiwan countryside.

1:Gallin E-4,5 (1957-1958) 1966
AD5 Taiw[illegible] Hokkien
Formosa AD1

NOTES

Chapter 1: Introduction

[1] During the last six or seven years of their regime, the Japanese government attempted to strengthen support of the war effort amongst the Taiwanese population. To do this, they expanded the compulsory school system and put in force many new regulations, i.e., only the Japanese language was used in the schools, Shinto religious symbols such as the Shinto God's shelf (*kamidana*) and Japanese patriotic scrolls replaced the traditional Taoist gods' statues and scrolls, Japanese festivals were observed, and many Taiwanese had to take Japanese names. However, immediately after war's end, the Taiwanese reverted to their traditional Taiwanese (Chinese) customs.

Chapter 2: The Setting

[1] The amount and distribution of rainfall in the Hsin Hsing area is: January .79–1.97 inches, April 3.95–5.90 inches, July 7.86–11.80 inches, October .79 inches. The average annual rainfall in the Chang-hua Hsien area is 39.37–59.05 inches.

[2] A great many of the overseas Chinese living in the Southeast Asian countries also came from the Ch'uan Chou and Chang Chou areas near Amoy.

[3] The historical information gathered from older residents of the area was based mainly on their own experiences as children and on stories told to them by their elders.

Some of the numerous gazetteers available are listed in the section of the bibliography on Chinese and Japanese Language Sources. Chen Shao-hsing, Professor of Sociology and Demography at National Taiwan University, first warned me in 1957 that some problems exist in using these and other such materials in attempting to gain detailed information about Taiwan generally, or about local areas particularly. Although Chen notes in his recent book (1964:196–197) that some earlier Ch'ing dynasty chroniclers, e.g., Chen Meng-lin, author of *Chu Lo Hsien Chih* (1716), and Chen Wen-ta, compiler of the *Taiwan Hsien Chih* (1720), were reliable, he also points out that some later ones such as Yu Wen-i (1758), Wang Ying-ts'eng (1760), Hsieh Chia-hsun (1807), and Chen Shu-chiu (1852) were unreliable. Chen (1964:196–197) points out that these latter authors cited what was mentioned in the Chen Wen-ta (1720) book regardless of the actual change in customs through time. Apparently, then, they employed the practice of compiling at least some of their data from previously written gazetteers rather than going out into the countryside to obtain the necessary information. But even the reliable gazetteers usually still presented a composite